

### CLAIMS

1. A process for the preparation of a mixture of mesitylene and durene which comprises treating pseudo-cumene with a catalytic composition containing a zeolite characterized by a spaciousness index equal to or greater than 3, in acid or prevalently acid form, at a temperature ranging from 210 to 450°C and a pressure ranging from 1 to 50 bar.
2. The process according to claim 1, wherein the catalyst contains a zeolite characterized by a spaciousness index equal to or greater than 5.
3. The process according to claim 1, wherein the zeolite is selected from beta zeolite, Y zeolite, ZSM-12 zeolite, MCM-22 zeolite, ERB-1, mazzite, mordenite, ZSM-20, L zeolite, ERS-10, Nu-1, Nu-88 and offretite.
4. The process according to claim 3, wherein the zeolite is beta zeolite.
5. The process according to any of the previous claims, wherein the catalytic composition contains the zeolite in the form bound with a binder selected from alumina, silica, magnesia, zirconia or their mixtures.
6. The process according to claim 5, wherein the zeolite is beta zeolite and the catalytic composition is characterized by an extrazeolitic porosity consisting for a fraction

of at least 25% of pores with a radius higher than 100 Å.

7. The process according to claim 6, wherein the catalytic composition is characterized by a total volume of extrazeolitic pores greater than or equal to 0.80 ml/g.

5 8. The process according to claim 1, wherein the zeolite is characterized by a molar ratio  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ranging from 4.5 to 4,000.

9. The process according to claim 8, wherein the molar ratio  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ranges from 4.5 to 400.

10 10. The process according to claim 1, wherein the temperature ranges from 225 to 400°C and the pressure ranges from 5 to 50 bar.

11. The process according to claim 1, carried out in liquid phase.

15 12. The process according to claim 1, wherein the WHSV space velocity ranges from 0.1 to 20 hours<sup>-1</sup>.

13. The process according to claim 1, carried out in continuous in a fixed bed reactor.

14. The process according to claim 5, wherein the weight  
20 ratio between zeolite and binder ranges from 5:95 to 95:5.

15. The process according to claim 14, wherein the weight ratio ranges from 20:80 to 80:20.

16. The process according to claim 1, wherein the process  
temperature is gradually increased and when the catalyst  
25 shows at least partial deactivation, it is cyclically sub-

jected to a rejuvenation process by increasing the temperature by at least 40°C for a time ranging from 100 to 300 hours, and the temperature conditions prior to the rejuvenation are subsequently re-established.

5 17. The process according to claim 1 which comprises the following steps:

a) treating pseudo-cumene with a catalyst containing a zeolite in acid form, characterized by a spaciousness index equal to or greater than 3, at a temperature  
10 ranging from 210 to 450°C and a pressure ranging from 1 to 50 bar to give a mixture containing mesitylene and durene;

b) subjecting the mixture resulting from step (a) to distillation to separate a first fraction containing xylenes, a second fraction containing non-converted  
15 pseudo-cumene, mesitylene and hemimellitene, a third fraction containing durene, isodurene and prenitene, and a residue;

c) recovering the mesitylene from the second fraction by  
20 means of distillation and recovering the durene from the third fraction by means of crystallization.

18. The process according to claim 17, wherein in step (c) the crystallization of durene from the third fraction is carried out without a solvent, at a temperature ranging  
25 from -20 to 10°C.

19. The process according to claim 18, wherein the crystals deriving from the crystallization are purified by means of washings with alcohols or light hydrocarbons.

20. The process according to claim 17, wherein pseudo-  
5 cumene and hemimellitene deriving from the distillation of the second fraction of step (c), are recycled to step (a).

21. The process according to claim 17, wherein isodurene and prenitene, remaining in the third fraction after the crystallization of durene, are recycled to step (a).

10 22. A process for regenerating an at least partially exhausted catalyst deriving from the process according to claim 1, which comprises treating said catalyst at a temperature ranging from 450 to 550°C, at a pressure ranging from 1 to 3 bar, with mixtures of oxygen and nitrogen in a  
15 ratio ranging from 0.1 to 20% by volume and with a GHSV space velocity ranging from 3,000 to 6,000 hours<sup>-1</sup>.

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